



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/535,333

08/09/2005

Peter A. Lovell

39-303

5715

23117 7590 11/12/2008  
NIXON & VANDERHYE, PC  
901 NORTH GLEBE ROAD, 11TH FLOOR  
ARLINGTON, VA 22203

EXAMINER

CHOI, LING SIU

ART UNIT

PAPER NUMBER

1796

MAIL DATE

DELIVERY MODE

11/12/2008

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/535,333	<b>Applicant(s)</b> LOVELL ET AL.	
	<b>Examiner</b> Ling-Siu Choi	<b>Art Unit</b> 1796	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-39 is/are pending in the application.
- 4a) Of the above claim(s) 37 and 38 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 39 is/are allowed.
- 6) ☒ Claim(s) 1,5-9,11-13,29 and 34 is/are rejected.
- 7) ☒ Claim(s) 2-4,10,14-28,30-33,35 and 36 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>10/03/2005</u> .  | 6) <input type="checkbox"/> Other: _____                          |

### DETAILED ACTION

1. This Office Action is corresponding to the Response to the Restriction/Election Requirement filed 07/24/2008. Claim 39 has been added and Claims 1-39 are now pending. Claims 5-36 of Group II have been elected with traverse. In view of Response, Group I will be rejoined with Group II. And Group III (claims 37-38) will not be rejoined with Group II because Group III is drawn to a specific compounds which do not share "the same technical feature that defines a contribution which the invention, considered as a whole, makes over the prior art." It is noted that **the invention** is drawn to a resin composition comprising a vinyl sulfonyl group which is generated from a precursor and then involved in the crosslinking of the resin instead of a specific organic compound comprising vinyl sulfonyl group. Thus, the Restriction/Election is made as final.

### *Claim Analysis*

2. Summary of Claim 1 [claims 2-4]:

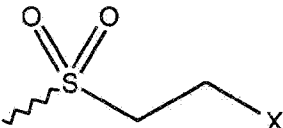
A method of effecting cross-linking of a resin comprising	
	generating vinyl sulfonyl moieties <i>in situ</i> with the resin,
	said vinyl sulfonyl moieties then undergoing a reaction which effects cross-linking of the resin.

Art Unit: 1796

Summary of Claim 5 [ claims 6-33]:

A cross-linkable resin composition comprising	
i	a polymer to be cross-linked;
ii	a liquid carrier for the polymer;
iii	nucleophilic groups; and
iv	vinyl sulfonyl precursor groups capable of generating vinyl sulfonyl groups on loss of liquid carrier from the composition
<u>at least one of the groups (iii) and (iv) being attached to the polymer to be cross-linked</u> whereby loss of the liquid carrier results in generation of a vinyl sulfonyl moiety to effect cross-linking of the polymer.	

Summary of claim 34 [claims 35-36]:

A latex comprising a continuous liquid phase and a discontinuous phase of a film-forming polymer incorporating	
(iii)	nucleophilic groups; and
(iv)	groups of the formula (I) <div style="text-align: center;">  </div> <p>X = a leaving groups and  <math>\sim</math> = a chemical bond to a carbon or heteroatom,          whereby <u>loss of liquid</u> results in  <u>generation</u> of a vinyl sulfonyl moiety by loss of HX on the groups of formula (I) and  <u>cross-linking</u> of the polymer by reaction of this vinyl sulfonyl and the nucleophilic groups.</p>

Art Unit: 1796

Summary of Claim 39:

A method of effecting cross-linking of a resin comprising	
	generating vinyl sulfonyl moieties <i>in situ</i> with the resin
	said vinyl sulfonyl moieties then undergoing a reaction which effects cross-linking of the resin wherein cross-linking results from reaction of the vinyl sulfonyl moieties with nucelophilic groups in the resin

***Claim Rejections - 35 USC § 102***

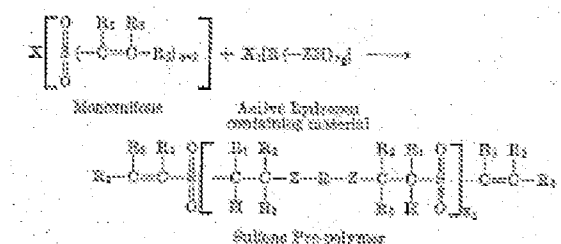
3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

**A person shall be entitled to a patent unless –**

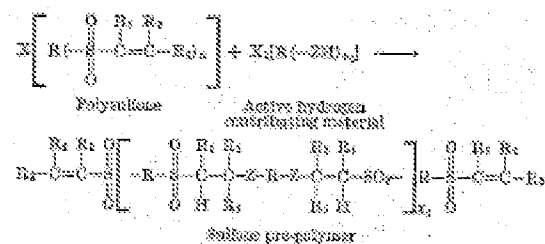
**(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.**

4. Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Tashlick et al. (US 3,153,021).

Tashlick et al. disclose a process to crosslink sulfone polymer, the method comprising (A) preparation of a pre-polymer - adding divinyl sulfone into a solution of sodium hydride in 1,4-butanediol at 120°C for 2 hours to obtain a pre-polymer having two vinyl sulfone groups



or



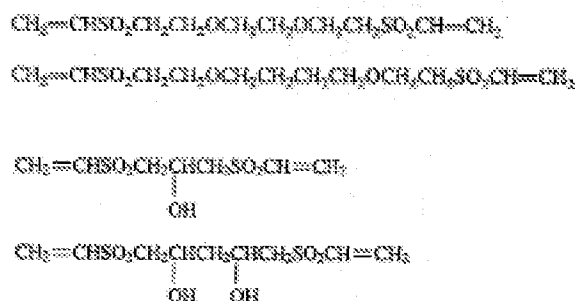
and (B) cross-linking - adding ethyl ketone peroxide into a mixture of methyl methacrylate and the pre-polymer to obtain crosslinked polymer (Example 1; col. 7, lines 10-47). It is noted that **step A** reads on “generating vinyl sulfonyl moieties in situ with the resin” and **step B** reads on “said sulfonyl moieties then undergoing a reaction which effects cross-linking of the resin.”

5. Claims 5-9, 11-13, 29, and 34 are rejected under 35 U.S.C. 102(b) as being anticipated by Hamilton et al. (US 5,514,535).

Hamilton et al. disclose a composition comprising a hydrophilic colloid [reading on “a polymer to be cross-linked”], bis(vinylsulfonyl)alkane [reading on “vinyl sulfonyl precursor group capable of generating vinyl sulfonyl groups on loss of liquid carrier from the composition”], and sodium sulfate [reading on “nucleophilic group”] in water [reading on “a liquid carrier”] (abstract; claims 2, 16, and 18). Hamilton et al. further

Art Unit: 1796

disclose that "to be effective in inhibiting homopolymerization of the vinyl sulfone hardener.....the sulfate can be blended with the hydrophilic colloid [reading on "at least one of the groups (iii) and (iv) being attached to the polymer to be crosslinked"] to be hardened so that upon addition of the hardener the sulfate is already present", wherein the hardener includes



(col. 6, lines 5-59; Examples 1-10). Thus, the present claims are anticipated by the disclosure of Hamilton et al.

### ***Allowable Subject Matter***

6. Claims 2-4, 10, 14-28, 30-33, 35-36 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims because the references of record [Tashlick et al. (US 3,153,021) and Hamilton et al. (US 5,514,535)] do not teach or fairly suggest the claimed method, cross-linkable resin composition, or latex

Art Unit: 1796

7. Claim 39 is allowable over the references of record: Tashlick et al. (US 3,153,021) and Hamilton et al. (US 5,514,535).

***Conclusion***

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ling-Siu Choi whose telephone number is 571-272-1098. The examiner can normally be reached on Monday to Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu can be reached on 571-272-1114. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

/Ling-Siu Choi/

Primary Examiner, Art Unit 1796

November 7, 2008



Application/Control Number: 10/535,333  
Art Unit: 1796

Page 8